# The Economics of Grain Drying

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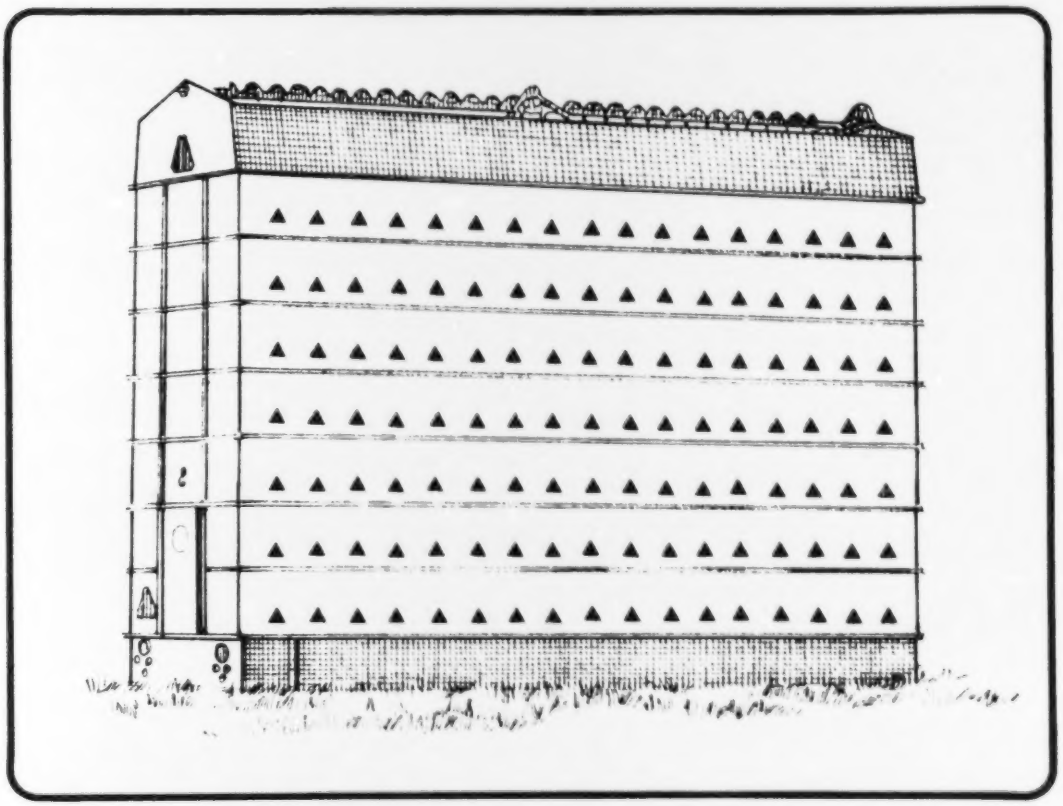

Alberta
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## PREFACE

Investing large amounts of capital in farm machinery and other capital assets when prices of farm produced commodities were high has caused many farmers to regret their earlier decisions since prices have dropped. Farm managers must constantly make decisions about investing as they are deciding and choosing among alternative ways of using their farming resources to achieve their goals. Practical decision-making tools can assist farm managers in their most important activity.

This article is intended to demonstrate the use of a partial budget in forecasting the result of a change in one part of an on going farm operation. Although the purchase of a drying system is used in this example, the method of partial budgeting can be used to analyze any change in a farm operation. Using the method outlined will help farm managers to improve their decision making and make progress toward their goals.

This publication was prepared by Craig Edwards, Farm Management Economist, under the direction of Gerd Andres, Supervisor, Farm Planning Section. We gratefully acknowledge the contribution of ideas and material from Leon Benoit, Assistant Regional Economist and Charlie Pearson, Regional Economist at Vermilion.

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# The Economics of Grain Drying

## Introduction

Large amounts of capital are invested in farming to acquire land, machinery, buildings and other assets. Financial decisions that were made in good times may be the cause of cash flow difficulties for farmers when prices fall. This article presents a simple method of doing a financial analysis before making a decision to acquire a drying system.

## Objective

The objective of this factsheet is to help farmers answer their four most important questions regarding investing in a grain drying system.

1. What are the advantages and disadvantages?
2. Is it profitable?
3. How will it affect cash flow?
4. What are the risks?

## What are the advantages and disadvantages of a grain drying system?

Farmers should approach the topic of buying grain drying equipment from the standpoint of harvest management (e.g. an earlier harvest) rather than just for use in an emergency situation such as a wet fall.

Suppose a farmer has 1000 acres to harvest. Think of the acreage divided into four equal parts of 250 acres. Traditionally, this farmer begins combining when the first grain is nearing dry (e.g. 14.5% moisture for wheat). However, by using grain drying equipment the harvest could start four to six days earlier while the cereal grain moisture content is still in the tough or damp stage. Drying would begin immediately and by the time the first quarter of harvest (i.e. 250 acres) is completed, the grain in the second quarter could be testing dry.

In other words, one-quarter of the harvest could be finished by the time the farmer would otherwise just be starting. Although only the first 250 acres are completed earlier than usual, the grain harvested in the last 250 acres has greatest potential to gain from the earlier harvest. The 4 to 6 days gained at the beginning of a harvest could mean 7 to 10 or more days saved later in the harvest season when the natural in-field drying rate is slower.

*Earlier harvest* - By starting earlier in the season, not only will the harvest be started earlier, but the total time required to complete the harvest will be shortened. This will allow more time after harvest for other activities (e.g. fall tillage, weed control, fertilizer application, winter preparations).

*More harvest time* - By harvesting grain as tough or damp and using artificial drying, one can make use of more harvesting hours per day and more harvest days per season. A better utilization of labor would result by spreading out the harvest work before the big push when grain tests dry.

*Less machine investment* - Because the total number of available harvest hours is increased by using a dryer, overall investment in machinery can be reduced. For example, buying a dryer for use with your present combine may be a better alternative to buying that larger or second combine. Along with the saving in combine investment there could be a corresponding saving in truck investment.

With a dryer in the system, straight combining becomes more feasible. Because an earlier harvest is possible, the risk of a wet snow on the standing crop is lessened. Also green kernels (second growth) pose less of a problem with a dryer in the system. By being able to straight combine part or perhaps all the crop, harvesting could be further advanced and the need for a swather might be reduced.

*Field losses minimized* - The longer that grain is exposed to the weather, the greater the likelihood

**Table 1** **In-Field overdrying costs**
Assume Grain Overdried by 2%

| Crop Choice | Value/Tonne ($) | Loss/Tonne ($) | Loss/Bushel (¢) |
|---|---|---|---|
| Barley | 110 | 2.60 | 5.6 |
| Wheat | 165 | 4.00 | 10.8 |
| Rapeseed | 350 | 8.40 | 19.0 |

Dry grain is easier to market and the price discount for tough or damp grade can be avoided.

**Table 2** **Discount for Tough and Damp Grain ($/Tonne)**

| Grain | | Tough | Damp |
|---|---|---|---|
| Wheat | (14.5 - 17.0%) | 7.00 | |
| | (17.0% +) | | 14.50 |
| Barley | (14.9 - 17.0%) | 6.00 | |
| | (17.0% +) | | 12.50 |
| Oats | (14.0 - 17.0%) | 6.00 | |
| | (17.0% +) | | 13.50 |
| Rapeseed | (10 - 12.5%) | 11.00 | |

(Discount for nonboard grain may vary between companies)

of grade loss, bushel weight loss, poor germination and loss of feed quality. Because a drying system enables harvest to be completed earlier and in less time, weather-induced grain deterioration is reduced. Losses caused by wildlife can also be minimized.

For crops that are swathed before combining, a quicker harvest will give the swath less time to settle, thus reducing pickup losses. Tests have shown that swathing and combining grain at higher moisture content results in less shelling out and less cracked grain.

*Marketing advantages* - Harvesting at a higher moisture content and drying the grain allows the farmer to market the grain at the optimum moisture content where grain weight is highest. Allowing nature to overdry grain in the field can be expensive.

*Avoid postharvest loss* - Losses from spoilage and associated in-bin insect damage can be reduced or eliminated. Finally, by advancing the harvest a week or more, completion is usually achieved earlier.

## Is it profitable?

Farmers considering investing in a dryer will have many ideas as to where they expect to increase returns or decrease returns. But to answer the question of whether it will be profitable, they need to put all the available information on a partial budget worksheet so they can summarize all the associated costs.

The following is an example of some of the many ways in which a drying system may increase returns. The farm in the example has 1000 cultivated acres and is continuously cropped to wheat. The farmer is considering buying a portable continuous flow dryer with a capacity of about 300 bushels of wheat

per hour. A hopper bottom wet grain surge bin, a dry grain auger and a moisture meter are also required.

Total investment expected is:

| | |
|---|---|
| Dryer | $24,000 |
| Propane tank | 2,000 |
| Auger | 1,500 |
| Bin | 1,500 |
| Moisture metre | 1,000 |
| Total | $30,000 |

The farmer expects the system to be used for 10 years and sold with a salvage value of $5,000 at the end of that time. The farm is in a wet area where the farmer expects to dry 50 per cent of the crop in the average year - about 500 acres of wheat averaging 35 bushels per acre.

The next step is to list the advantages and disadvantages of using the drying system and placing a dollar value on every detail. In other words the farmer can estimate the costs and benefits of the drying system by using a budgeting procedure.

A partial budget format is shown on the following page; note that it is divided into quadrants. In the appendix are four pages of detailed partial budget worksheets, each page corresponding to one of the quadrants shown in the partial budget. Complete each page in detail, then summarize it and enter it in the corresponding quadrant of the one-page partial budget.

Start by completing worksheet page 8, corresponding to quadrant 1 of the partial budget. The disadvantages are entered on page 8, these would be the added annual costs expected. Work through the other three worksheet pages putting values on the disadvantages and advantages. Then summarize this information on the partial budget as shown for the sample grain drying system.

## Using a Partial Budget

The partial budget on page 4 shows the estimated change in annual farm profits to be $3,965 under the circumstances described. In other words, the grain drying system being considered should be profitable and acceptable. The investment of $30,000 should pay the average annual costs (disadvantages) of $8,231 and leave $3,965 of surplus.

Using the method above, different drying systems could be compared and a decision made on which drying system to choose.

A farmer could consider a natural air drying system where the capital investment may be much less. The system may have fewer advantages (added annual receipts plus reduced annual costs) but also may have fewer disadvantages (added annual cost plus reduced annual receipts). If the less costly system can remove most of the risks of not having any drying system, it may be adequate and produce more annual farm profits than the system with a higher capital investment. On the other hand, such a system may not reduce the risks enough and be inadequate for the needs of the particular farmer in a particular situation.

Partial budget estimates provide a method for farmers to use in comparing different systems in a systematic, analytical way. This method will help farmers to put down on paper their reasons for making decisions and help them to make better decisions in the future. Having the calculations on paper may also be helpful in explaining to spouses, children, partners and even lenders why the proposed investment is a good idea.

## How Will it Affect Cash Flow

The partial budget showed an expected increase in profits of $3,965 with an allocation of interest costs and depreciation amounting to $5,025 per year. In other words the capital cost of $30,000 less the estimated salvage value of $5,000 at the end of 10 years was spread over 10 years. Annual depreciation charges are estimated to recover the cost of an asset over time and annual interest charges represent the opportunity cost of capital. These accounting procedures are useful and acceptable for the purpose of estimating profitability when considering investments, but we also have to consider the cash flow realities.

For our example of the grain drying system, we must look at how to pay the capital cost of $30,000 if the farmer decides it is an acceptable investment.

## PARTIAL BUDGET

Estimated change in annual farm profits from the proposed change of using a heated air drying system in harvest management to start harvesting earlier and have more control of events.

| Disadvantages (Debits) | | Advantages (Credits) | |
|---|---|---|---|
| 1. Added Annual Costs Expected | | 3. Added Annual Receipts Expected | |
| Total variable costs | 2786 | Estimated benefits | 11583 |
| Fixed costs (non cash) | | | |
| Interest + depreciation | 5025 | | |
| Housing | 100 | | |
| Fixed Costs (cash) | | | |
| Insurance | 200 | | |
| Power | 120 | | |
| Total Fixed Costs | 5445 | | |
| Total added Costs | 8231 | | |
| 2. Reduced Annual Receipts Expected | | 4. Reduced Annual Costs Expected | |
| nil | | No custom drying | 613 |
| Total Disadvantages A. | 8231 | Total Advantages B. | 12196 |
| Estimated Change in Annual Farm Profits (B minus A) | | 12196 - 8231 = 3965 | |

## OTHER CONSIDERATIONS OF PROPOSED CHANGE

| | | | |
|---|---|---|---|
| Extra Capital Needed | 30000 | Degree of risk | |
| Extra labor to hire | included | Time lag until income starts | 1 year |
| Other Disadvantages of Proposed Change | | Other Advantages of Proposed Change | |
| Increase fixed costs | | Earlier harvest | |
| Needs more managment skill to operate and supervise. | | More control of harvest | |
| | | Equipment can be sold. | |

Assuming the farmer does not have $30,000 in cash to buy the system, what kind of a loan will be most useful? A 10-year loan would correspond to the useful life estimated for the system, but a lender might not like to lend for such a long time. Five year loans are much more common so we have assumed a loan of $30,000 at 12 per cent for five years. The following worksheet shows yearly cash flow from the proposed change.

The figures entered on the cash flow worksheet are taken from the partial budget, except that noncash costs of $100 for housing and the interest and depreciation of $5,025 have not been entered in the cash flow. Instead of interest and depreciation charges, the actual loan payments for a loan of $30,000 at 12 per cent interest amortized over five years were entered under annual added costs.

The total cost of the disadvantages was subtracted from total value of the advantages to show a cash surplus of $768 annually for the first five years, followed by five years with an annual cash surplus of $9,090.

The figures show that a loan with annual payments of $8,322 is feasible, but with a projected cash surplus of only $768, a farmer may want to look at other alternatives.

## YEARLY CASH FLOW FOR PROPOSED CHANGE

| YEAR | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| DISADVANTAGES | | | | | | | | | | |
| 1. Added annual costs | | | | | | | | | | |
| Variable | 2786 | 2786 | 2786 | 2786 | 2786 | 2786 | 2786 | 2786 | 2786 | 2786 |
| Fixed (cash) | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 |
| Loan payments (at 12%, 5 yr) | 8322 | 8322 | 8322 | 8322 | 8322 | | | | | |
| 2. Reduced receipts | ø | | | | | | | | | |
| TOTAL DISADVANTAGES | 11428 | 11428 | 11428 | 11428 | 11428 | 3106 | 3106 | 3106 | 3106 | 3106 |
| ADVANTAGES | | | | | | | | | | |
| 3. Added annual receipts | 11583 | 11583 | 11583 | 11583 | 11583 | 11583 | 11583 | 11583 | 11583 | 11583 |
| 4. Reduced annual costs | 613 | 613 | 613 | 613 | 613 | 613 | 613 | 613 | 613 | 613 |
| TOTAL ADVANTAGES | 12196 | 12196 | 12196 | 12196 | 12196 | 12196 | 12196 | 12196 | 12196 | 12196 |
| CASH SURPLUS OR DEFICIT | 768 | 768 | 768 | 768 | 768 | 9090 | 9090 | 9090 | 9090 | 9090 |

If an alternative system could provide nearly all the benefits of the system in our example but show a larger surplus, it could be a better investment. The best way to compare systems is to work out the advantages and disadvantages and place a value on them. Then use the partial budget and cash flow tools to compare them on the same basis.

## What are the risks?

Will all the calculating and consideration of alternatives cut down on the risk and uncertainty of future events? The answer is not much, but decision making under uncertain conditions can be improved. Very few people can make the correct decision every time. Plans may be well thought out but the future is unknowable. Decisions must be made and the best that managers can do is improve their batting average by using consistent and methodical procedures such as the partial budget and cash flow analysis to analyze information.

*Income Tax* - If farmers making a capital investment, such as the grain drying system shown in the example, expect to have taxable income in the years of use, they should also include the appropriate tax calculations in the projections.

Those calculations might include the effect of investment tax credits and capital cost allowances on cash flows. Taxable incomes and marginal tax rates will probably also be changed by the investment.

Farmers with a high taxable income can make use of investment tax credits and capital cost allowance deductions to decrease their taxable income and income tax, both of which reduce cash outflows. This would make their cash inflow surplus larger and the investment more attractive because of lower after-tax cash outflows.

Farmers with a low taxable income who get less advantage from tax deductions will find the investment less attractive because of higher after-tax cash outflows than farmers with higher taxable income.

*Time Value of Money* - Cash outflows and inflows paid out or received over a period of several years can be compared effectively only by calculating present values. More complex calculations and financial tables or financial calculators are required for this method of analysis.

Farm managers seriously interested in a more complete analysis can request help with more complex calculations by phoning or writing the writer of the article.

## Summary

What advantage will a farmer have from working out the above example? So far, we have looked at only one alternative but we have used a method that can be used on all the alternatives a farmer has time to explore.

The question of whether it will pay has been answered for our one grain drying system in the example. Yes, it will pay if future events happen as they were projected. Few farmers or financial professionals would expect the future to unfold as projected, but a projection is better than no plan at all. Planning cannot eliminate the unpredictability of the future. If our plans and projections help us to respond more quickly and to expect the unexpected they will be useful.

Another point for a farmer to consider is whether he/she can afford it. Those who can pay for the system up front with cash will not have to do many calculations unless something drastic happens. Farmers with smaller cash flows may consider both cash flows and risks and perhaps how a loan might be acquired.

The final decision as to the purchase is for the farmer to make. After examining other alternatives using the above method, a farmer will be able to make a more informed decision.

Interested readers are invited to write to us at the Farm Business Management Branch, Box 2000, Olds, Alberta, T0M 1P0, to express their ideas on improving our articles and publications. We are interested in knowing if readers want articles showing how to do calculations for financial planning. Readers can also request individual help from our staff in making financial calculations they are not able to do themselves. Contact us by phone or letter.

# Appendix
# Calculations

## Estimating Fixed Cost

For the example on page 8 a fixed cost of $5,025 was shown as the amortized fixed cost. Common practice (traditional method) is to estimate depreciation and interest to determine an annual combined fixed cost. The method used here is a capital recovery method which is proving to be more realistic than the traditional method.

The capital recovery method is based on the amount of money required at the end of each year to pay interest on the unrecovered capital at a designated interest rate and recover the capital invested within the specified number of years. In other words, the investors expect a return from the investment as if they had loaned money to the investment. In our example farmers would expect the drying system to return all the capital ($30,000) within the 10 years of use and pay interest at a rate equal to what they would earn in the next best investment.

The calculations used to find the annual fixed costs are a little more complex and require the use of financial tables which are included on pages 12 to 15.

## Calculating Annual Capital Recovery Charge

The formula is:

$$\frac{\text{(Original Investment)} - \left(\text{Present value of salvage value}\right)}{\text{(PV of single sum for 10 years at 12\% interest)}}$$

divided by present value factor of a series of payments.

Original investment = $30,000
Salvage value at end of 10 years = $5,000
Look up present value factor for **10** years at **12%** in Table 1 which shows the present value of $1 to be received in the future.

In the column for 12% and the row for 10 years is the PV factor = .3220.

Multiply salvage value times .3220 = 5,000 x .3220 = 1,610 which is the present value of the $5,000 expected in 10 years.

Look up present value factor in Table 2 for 10 years at 12%. In the column for 12% and the row for 10 years is the PV factor = 5.650

Enter the numbers in the formula and perform calculations:

$30,000 - $1,610 = $28,390

$28,390 ÷ 5.650 = $5,025 (rounded from 5024.78)

So the annual charge for depreciation and interest using the capital recovery method = **$5,025**

## DETAILED PARTIAL BUDGET WORKSHEET

**Disadvantages: Quadrant #1 - Added Annual Costs Expected**

| VARIABLE COSTS | Your Farm |
|---|---|
| 1. Fuel Costs .3 litres/bu x 17500 bu x $.23 litre | 1208 |
| 2. Tractor Fuel 17500bu / 200 bu/hr = 88 hours x $2.50 hour | 220 |
| 3. Lubrication 10% of fuel costs | 143 |
| 4. Electric Power Costs $.0020 per bushel | 35 |
| 5. Repairs 30000 x 1% | 300 |
| 6. Labor 88 hours at $10 per hour (cash) | 880 |
| Total Variable Costs | 2786 |

Variable Cost per Bushel
$2786 ÷ 17500 = 15.92 per bu

**FIXED COSTS**

Annualization of capital investment assuming equal annual fixed costs at opportunity cost rate.

Formula:
(Original Investment - Present Value of Salvage) divided by cumulative present value factor for use of machine for 10 years at 12 %.

$30,000 - $1,610 = $28,390

$28,390 ÷ 5.650 = 5025

| | |
|---|---|
| Amortized annual costs | $ 5025 |
| Insurance | 200 |
| Housing (estimated - not cash) | 100 |
| Increased in fixed monthly power bill | 120 |
| TOTAL FIXED COSTS | 5445 |
| **Total added annual costs expected** | 8231 |

## DETAILED PARTIAL BUDGET WORKSHEET

| Disadvantages: Quadrant #2 - Reduced Annual Receipts Expected |
| --- |
| |
| Total Reduced Annual Receipts Expected — None |

## DETAILED PARTIAL BUDGET WORKSHEET
## ESTIMATED ADDED RETURNS

**Advantages: Quadrant #3 - Added Annual Receipts Expected**

| | Your Farm |
|---|---|
| 1. Grade Loss Avoided (¼ of total harvest 1 grade better)<br>500 acres x 35 bu/ac x $.20 bu differential | = 3500 |
| 2. "Tough" Discount Avoided<br>250 acres x 35 bu/ac x $.20 bu | = 1750 |
| 3. Bushel Weight Saved<br>2 lb/bu ÷ 60 lb/bu x 500 ac (continued)<br>x 35 bu/ac x $4.00 /bu | = 2333 |
| 4. Reduced Mechanical Losses<br>1 bu/ac x 500 ac = 500 bu x $400 bu | = 2000 |
| 5. Reduced Natural Losses<br>½ bu/ac x 1000 ac x $4.00 bu | = 2000 |
| 6. In-Field Overdrying Avoided | |
| 7. Improved Germination (seed or malt barley grade) | |
| 8. Easier Marketing | |
| 9. In Bin Spoilage Losses Reduced or Eliminated | |
| 10. Non-Completion Losses Avoided | |
| 11. More Time For Fall Work | |
| 12. Custom Drying | |
| **TOTAL ADDED ANNUAL RECEIPTS EXPECTED** | 11 583 |

## DETAILED PARTIAL BUDGET WORKSHEET

| Advantages: Quadrant #4 - Reduced Annual Costs Expected | Your Farm |
|---|---|
| 1. Labor | |
| 2. Reduced Swathing Costs | |
| 3. Reduced Combining Costs | |
| 4. Less Equipment Investment | |
| 5. Save Custom Drying Costs | $613 |
| 6. Other | |
| Total Reduced Annual Costs Expected | $613 |

Table 1

**SINGLE PAYMENT**

## PRESENT VALUE FACTORS

This table is used to determine the present value of a single payment received 'n' years from the present, or it may be used in reverse to find the future value of a given sum of money.

| Years | 1% | 2% | 3% | 4% | 5% | 6% | 7% | 8% | 9% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .9901 | .9804 | .9709 | .9615 | .9524 | .9434 | .9346 | .9259 | .9174 | .9091 |
| 2 | .9803 | .9612 | .9426 | .9246 | .9070 | .8900 | .8734 | .8573 | .8417 | .8264 |
| 3 | .9706 | .9423 | .9151 | .8890 | .8638 | .8396 | .8163 | .7938 | .7722 | .7513 |
| 4 | .9610 | .9238 | .8885 | .8548 | .8227 | .7921 | .7629 | .7350 | .7084 | .6830 |
| 5 | .9515 | .9057 | .8626 | .8219 | .7835 | .7473 | .7130 | .6806 | .6499 | .6209 |
| 6 | 9420 | .8880 | .8375 | .7903 | .7462 | .7050 | .6663 | .6302 | .5963 | .5645 |
| 7 | .9327 | .8706 | .8131 | .7599 | .7107 | .6651 | .6227 | .5835 | .5470 | .5132 |
| 8 | .9235 | .8535 | .7894 | .7307 | .6768 | .6274 | .5820 | .5403 | .5019 | .4665 |
| 9 | .9143 | .8368 | .7664 | .7026 | .6446 | .5919 | .5439 | .5002 | .4604 | .4241 |
| 10 | .9053 | .8203 | .7441 | .6756 | .6139 | .5584 | .5083 | .4632 | .4224 | .3855 |
| 11 | .8963 | .8043 | .7224 | .6496 | .5847 | .5268 | .4751 | .4289 | .3875 | .3505 |
| 12 | .8874 | .7885 | .7014 | .6246 | .5568 | .4970 | .4440 | .3971 | .3555 | .3186 |
| 13 | .8787 | .7730 | .6810 | .6006 | .5303 | .4688 | .4150 | .3677 | .3262 | .2897 |
| 14 | .8700 | .7579 | .6611 | .5775 | .5051 | .4423 | .3878 | .3405 | .2992 | .2633 |
| 15 | .8613 | .7430 | .6419 | .5553 | .4810 | .4173 | .3624 | .3152 | .2745 | .2394 |
| 16 | .8528 | .7284 | .6232 | .5339 | .4581 | .3936 | .3387 | .2919 | .2519 | .2176 |
| 17 | .8444 | .7142 | .6050 | .5134 | .4363 | .3714 | .3166 | .2703 | .2311 | .1978 |
| 18 | .8360 | .7002 | .5874 | .4936 | .4155 | .3503 | .2959 | .2502 | .2120 | .1799 |
| 19 | .8277 | .6864 | .5703 | .4746 | .3957 | .3305 | .2765 | .2317 | .1945 | .1635 |
| 20 | .8195 | .6730 | .5537 | .4564 | .3769 | .3118 | .2584 | .2145 | .1784 | .1486 |
| 21 | .8114 | .6598 | .5375 | .4388 | .3589 | .2942 | .2415 | .1987 | .1637 | .1351 |
| 22 | .8034 | .6468 | .5219 | .4220 | .3418 | .2775 | .2257 | .1839 | .1502 | .1228 |
| 23 | .7954 | .6342 | .5067 | .4057 | .3256 | .2618 | .2109 | .1703 | .1378 | .1117 |
| 24 | .7876 | .6217 | .4919 | .3901 | .3101 | .2470 | .1971 | .1577 | .1264 | .1015 |
| 25 | .7798 | .6095 | .4776 | .3751 | .2953 | .2330 | .1842 | .1460 | .1160 | .0923 |
| 26 | .7720 | .5976 | .4637 | .3607 | .2812 | .2198 | .1722 | .1352 | .1064 | .0839 |
| 27 | .7644 | .5859 | .4502 | .3468 | .2678 | .2074 | .1609 | .1252 | .0976 | .0763 |
| 28 | .7568 | .5744 | .4371 | .3335 | .2551 | .1956 | .1504 | .1159 | .0895 | .0693 |
| 29 | .7493 | .5631 | .4243 | .3207 | .2429 | .1846 | .1406 | .1073 | .0822 | .0630 |
| 30 | .7419 | .5521 | .4120 | .3083 | .2314 | .1741 | .1314 | .0994 | .0754 | .0573 |
| 31 | .7346 | .5412 | .4000 | .2965 | .2204 | .1643 | .1228 | .0920 | .0691 | .0521 |
| 32 | .7273 | .5306 | .3883 | .2851 | .2099 | .1550 | .1147 | .0852 | .0634 | .0474 |
| 33 | .7201 | .5202 | .3770 | .2741 | .1999 | .1462 | .1072 | .0789 | .0582 | .0431 |
| 34 | .7130 | .5100 | .3660 | .2636 | .1904 | .1379 | .1002 | .0730 | .0534 | .0391 |
| 35 | .7059 | .5000 | .3554 | .2534 | .1813 | .1301 | .0937 | .0676 | .0490 | .0356 |
| 36 | .6989 | .4902 | .3450 | .2437 | .1727 | .1227 | .0875 | .0626 | .0449 | .0323 |
| 37 | .6920 | .4806 | .3350 | .2343 | .1644 | .1158 | .0818 | .0580 | .0412 | .0294 |
| 38 | .6852 | .4712 | .3252 | .2253 | .1566 | .1092 | .0765 | .0537 | .0378 | .0267 |
| 39 | .6784 | .4619 | .3158 | .2166 | .1491 | .1031 | .0715 | .0497 | .0347 | .0243 |
| 40 | .6717 | .4529 | .3066 | .2083 | .1420 | .0972 | .0668 | .0460 | .0318 | .0221 |

Table 1

**SINGLE PAYMENT**

## PRESENT VALUE FACTORS (continued)

This table is used to determine the present value of a single payment received 'n' years from the present, or it may be used in reverse to find the future value of a given sum of money.

| Years | 11% | 12% | 13% | 14% | 15% | 16% | 17% | 18% | 19% | 20% |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .9009 | .8929 | .8850 | .8772 | .8696 | .8621 | .8547 | .8475 | .8403 | .8333 |
| 2 | .8116 | .7972 | .7831 | .7695 | .7561 | .7432 | .7305 | .7182 | .7062 | .6944 |
| 3 | .7312 | .7118 | .6931 | .6750 | .6575 | .6407 | .6244 | .6086 | .5934 | .5787 |
| 4 | .6587 | .6355 | .6133 | .5921 | .5718 | .5523 | .5337 | .5158 | .4987 | .4823 |
| 5 | .5935 | .5674 | .5428 | .5194 | .4972 | .4761 | .4561 | .4371 | .4190 | .4019 |
| 6 | .5346 | .5066 | .4803 | .4556 | .4323 | .4104 | .3898 | .3704 | .3521 | .3349 |
| 7 | .4817 | .4523 | .4251 | .3996 | .3759 | .3538 | .3332 | .3139 | .2959 | .2791 |
| 8 | .4339 | .4039 | .3762 | .3506 | .3269 | .3050 | .2848 | .2660 | .2487 | .2326 |
| 9 | .3909 | .3606 | .3329 | .3075 | .2843 | .2630 | .2434 | .2255 | .2090 | .1938 |
| 10 | .3522 | .3220 | .2946 | .2697 | .2472 | .2267 | .2808 | .1911 | .1756 | .1615 |
| 11 | .3173 | .2875 | .2607 | .2366 | .2149 | .1954 | .1778 | .1619 | .1476 | .1346 |
| 12 | .2858 | .2567 | .2307 | .2076 | .1869 | .1685 | .1520 | .1372 | .1240 | .1122 |
| 13 | .2575 | .2292 | .2042 | .1821 | .1625 | .1452 | .1299 | .1163 | .1042 | .0935 |
| 14 | .2320 | .2046 | .1807 | .1597 | .1413 | .1252 | .1110 | .0985 | .0876 | .0779 |
| 15 | .2090 | .1827 | .1599 | .1401 | .1229 | .1079 | .1949 | .0835 | .0736 | .0649 |
| 16 | .1883 | .1631 | .1415 | .1229 | .1069 | .0930 | .0818 | .0708 | .0618 | .0541 |
| 17 | .1696 | .1456 | .1252 | .1078 | .0929 | .0802 | .0693 | .0600 | .0520 | .0451 |
| 18 | .1528 | .1300 | .1108 | .0946 | .0808 | .0691 | .0592 | .0508 | .0437 | .0376 |
| 19 | .1377 | .1161 | .0981 | .0829 | .0703 | .0596 | .0506 | .0431 | .0367 | .0313 |
| 20 | .1240 | .1037 | .0868 | .0728 | .0611 | .0514 | .0433 | .0365 | .0303 | .0261 |
| 21 | .1117 | .0926 | .0768 | .0638 | .0531 | .0443 | .0370 | .0309 | .0259 | .0217 |
| 22 | .1007 | .0826 | .0680 | .0560 | .0462 | .0382 | .0316 | .0262 | .0218 | .0181 |
| 23 | .0907 | .0738 | .0601 | .0491 | .0402 | .0329 | .0270 | .0222 | .0183 | .0151 |
| 24 | .0817 | .0659 | .0532 | .0431 | .0349 | .0284 | .0231 | .0188 | .0154 | .0126 |
| 25 | .0736 | .0588 | .0471 | .0378 | .0304 | .0245 | .0197 | .0160 | .0129 | .0105 |
| 26 | .0663 | .0525 | .0417 | .0331 | .0264 | .0211 | .0169 | .0135 | .0109 | .0087 |
| 27 | .0597 | .0469 | .0369 | .0291 | .0230 | .0182 | .0144 | .0115 | .0091 | .0073 |
| 28 | .0538 | .0419 | .0326 | .0255 | .0200 | .0157 | .0123 | .0097 | .0077 | .0061 |
| 29 | .0485 | .0374 | .0289 | .0224 | .0174 | .0135 | .0105 | .0082 | .0064 | .0051 |
| 30 | .0437 | .0334 | .0256 | .0196 | .0151 | .0116 | .0090 | .0070 | .0054 | .0042 |
| 31 | .0394 | .0298 | .0226 | .0172 | .0131 | .0100 | .0077 | .0059 | .0046 | .0035 |
| 32 | .0355 | .0266 | .0200 | .0151 | .0114 | .0087 | .0066 | .0050 | .0038 | .0029 |
| 33 | .0319 | .0238 | .0177 | .0132 | .0099 | .0075 | .0056 | .0042 | .0032 | .0024 |
| 34 | .0288 | .0212 | .0157 | .0116 | .0086 | .0064 | .0048 | .0036 | .0027 | .0020 |
| 35 | .0259 | .0189 | .0139 | .0102 | .0075 | .0055 | .0041 | .0030 | .0023 | .0017 |
| 36 | .0234 | .0169 | .0123 | .0089 | .0065 | .0048 | .0035 | .0026 | .0019 | .0014 |
| 37 | .0210 | .0151 | .0109 | .0078 | .0057 | .0041 | .0030 | .0022 | .0016 | .0012 |
| 38 | .0190 | .0135 | .0096 | .0069 | .0049 | .0036 | .0026 | .0019 | .0013 | .0010 |
| 39 | .0171 | .0120 | .0085 | .0060 | .0043 | .0031 | .0022 | .0016 | .0011 | .0008 |
| 40 | .0154 | .0107 | .0075 | .0053 | .0037 | .0026 | .0019 | .0013 | .0010 | .0007 |

Table 2

## CUMULATIVE PRESENT VALUE FACTORS

This table is used to determine the present value of a series of 'n' payments.

| Years | 1% | 2% | 3% | 4% | 5% | 6% | 7% | 8% | 9% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 - 1 | .990 | .980 | .971 | .962 | .952 | .943 | .935 | .926 | .917 | .909 |
| 2 | 1.970 | 1.942 | 1.913 | 1.886 | 1.859 | 1.833 | 1.808 | 1.783 | 1.759 | 1.736 |
| 3 | 2.941 | 2.884 | 2.829 | 2.775 | 2.723 | 2.673 | 2.624 | 2.577 | 2.531 | 2.487 |
| 4 | 3.902 | 3.808 | 3.717 | 3.630 | 3.546 | 3.465 | 3.387 | 3.312 | 3.240 | 3.170 |
| 5 | 4.853 | 4.713 | 4.580 | 4.452 | 4.329 | 4.212 | 4.100 | 3.993 | 3.890 | 3.791 |
| 6 | 5.795 | 5.601 | 5.417 | 5.242 | 5.076 | 4.971 | 4.767 | 4.623 | 4.486 | 4.355 |
| 7 | 6.728 | 6.472 | 6.230 | 6.002 | 5.786 | 5.582 | 5.389 | 5.206 | 5.033 | 4.868 |
| 8 | 7.652 | 7.325 | 7.020 | 6.733 | 6.463 | 6.210 | 5.971 | 5.747 | 5.535 | 5.335 |
| 9 | 8.566 | 8.162 | 7.786 | 7.435 | 7.108 | 6.802 | 6.515 | 6.247 | 5.995 | 5.759 |
| 10 | 9.471 | 8.983 | 8.530 | 8.111 | 7.722 | 7.360 | 7.024 | 6.710 | 6.418 | 6.145 |
| 11 | 10.378 | 9.787 | 9.253 | 8.760 | 8.306 | 7.887 | 7.499 | 7.139 | 6.805 | 6.495 |
| 12 | 11.255 | 10.575 | 9.954 | 9.385 | 8.863 | 8.384 | 7.943 | 7.536 | 7.161 | 6.814 |
| 13 | 12.134 | 11.348 | 10.635 | 9.986 | 9.394 | 8.853 | 8.358 | 7.904 | 7.487 | 7.103 |
| 14 | 13.004 | 12.106 | 11.296 | 10.563 | 9.899 | 9.295 | 8.745 | 8.244 | 7.786 | 7.367 |
| 15 | 13.865 | 12.849 | 11.938 | 11.118 | 10.380 | 9.712 | 9.108 | 8.559 | 8.061 | 7.606 |
| 16 | 14.718 | 13.578 | 12.561 | 11.652 | 10.838 | 10.106 | 9.447 | 8.851 | 8.313 | 7.824 |
| 17 | 15.562 | 14.292 | 13.166 | 12.166 | 11.274 | 10.477 | 9.763 | 9.122 | 8.544 | 8.022 |
| 18 | 16.398 | 14.992 | 13.754 | 12.659 | 11.690 | 10.828 | 10.059 | 9.372 | 8.756 | 8.201 |
| 19 | 17.226 | 15.678 | 14.324 | 13.134 | 12.085 | 11.158 | 10.336 | 9.604 | 8.950 | 8.365 |
| 20 | 18.046 | 16.351 | 14.877 | 13.590 | 12.462 | 11.470 | 10.594 | 9.818 | 9.129 | 8.514 |
| 21 | 18.857 | 17.011 | 15.415 | 14.029 | 12.821 | 11.764 | 10.836 | 10.017 | 9.292 | 8.649 |
| 22 | 19.660 | 17.658 | 14.937 | 14.451 | 13.163 | 12.042 | 11.061 | 10.201 | 9.442 | 8.772 |
| 23 | 20.456 | 18.292 | 16.444 | 14.857 | 13.489 | 12.303 | 11.272 | 10.371 | 9.580 | 8.883 |
| 24 | 21.243 | 18.914 | 16.936 | 15.247 | 13.799 | 12.550 | 11.469 | 10.529 | 9.707 | 8.985 |
| 25 | 22.023 | 19.523 | 17.413 | 15.622 | 14.094 | 12.783 | 11.654 | 10.675 | 9.823 | 9.077 |
| 26 | 22.795 | 20.121 | 17.877 | 15.983 | 14.375 | 13.003 | 11.826 | 10.810 | 9.929 | 9.161 |
| 27 | 23.560 | 20.707 | 18.327 | 16.330 | 14.643 | 13.211 | 11.987 | 10.935 | 10.207 | 9.237 |
| 28 | 24.316 | 21.281 | 18.764 | 16.663 | 14.898 | 13.406 | 12.137 | 11.051 | 10.116 | 9.307 |
| 29 | 25.066 | 21.844 | 19.188 | 16.984 | 15.141 | 13.591 | 12.278 | 11.158 | 10.198 | 9.370 |
| 30 | 25.808 | 22.396 | 19.600 | 17.292 | 15.372 | 13.765 | 12.409 | 11.258 | 10.274 | 9.427 |
| 31 | 26.542 | 22.938 | 20.000 | 17.588 | 15.593 | 13.929 | 12.532 | 11.350 | 10.343 | 9.479 |
| 32 | 27.720 | 23.468 | 20.389 | 17.874 | 15.803 | 14.084 | 12.647 | 11.435 | 10.406 | 9.526 |
| 33 | 27.990 | 23.989 | 20.766 | 18.148 | 16.003 | 14.230 | 12.754 | 11.514 | 10.464 | 9.569 |
| 34 | 28.703 | 24.499 | 21.132 | 18.411 | 16.193 | 14.368 | 12.854 | 11.587 | 10.518 | 9.609 |
| 35 | 29.409 | 24.999 | 21.487 | 18.665 | 16.374 | 14.498 | 12.948 | 11.655 | 10.567 | 9.644 |
| 36 | 30.108 | 25.489 | 21.832 | 18.908 | 16.547 | 14.621 | 13.035 | 11.717 | 10.612 | 9.677 |
| 37 | 30.780 | 25.969 | 22.167 | 19.143 | 16.711 | 14.737 | 13.117 | 11.775 | 10.653 | 9.706 |
| 38 | 31.485 | 26.441 | 22.492 | 19.368 | 16.868 | 14.846 | 13.193 | 11.829 | 10.691 | 9.733 |
| 39 | 32.163 | 26.903 | 22.808 | 19.584 | 17.017 | 14.949 | 13.265 | 11.879 | 10.726 | 9.757 |
| 40 | 32.835 | 27.355 | 23.115 | 19.793 | 17.159 | 15.046 | 13.332 | 11.925 | 10.757 | 9.779 |

Table 2

## CUMULATIVE PRESENT VALUE FACTORS (continued)

This table is used to determine the present value of a series of 'n' payments.

| Years | 11% | 12% | 13% | 14% | 15% | 16% | 17% | 18% | 19% | 20% |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 - 1 | .901 | .893 | .885 | .877 | .870 | .862 | .855 | .848 | .840 | .833 |
| 2 | 1.712 | 1.690 | 1.668 | 1.647 | 1.626 | 1.605 | 1.585 | 1.566 | 1.546 | 1.528 |
| 3 | 2.444 | 2.402 | 2.361 | 2.322 | 2.283 | 2.246 | 2.210 | 2.174 | 2.140 | 2.106 |
| 4 | 3.102 | 3.307 | 2.974 | 2.914 | 2.855 | 2.798 | 2.743 | 2.690 | 2.639 | 2.489 |
| 5 | 3.696 | 3.605 | 3.517 | 3.433 | 3.352 | 3.274 | 3.199 | 3.127 | 3.058 | 2.991 |
| 6 | 4.230 | 4.111 | 3.998 | 3.889 | 3.784 | 3.685 | 3.589 | 3.498 | 3.410 | 3.326 |
| 7 | 4.712 | 4.564 | 4.423 | 4.288 | 4.160 | 4.039 | 3.922 | 3.812 | 3.706 | 3.405 |
| 8 | 5.146 | 4.968 | 4.799 | 4.639 | 4.487 | 4.344 | 4.207 | 4.078 | 3.954 | 3.837 |
| 9 | 5.537 | 5.328 | 5.132 | 4.946 | 4.772 | 4.607 | 4.451 | 4.303 | 4.163 | 4.031 |
| 10 | 5.889 | 5.650 | 5.426 | 5.216 | 5.019 | 4.833 | 4.659 | 4.494 | 4.339 | 4.192 |
| 11 | 6.206 | 5.938 | 5.687 | 5.453 | 5.234 | 5.029 | 4.836 | 4.656 | 4.486 | 4.327 |
| 12 | 6.492 | 6.194 | 5.918 | 5.660 | 5.420 | 5.197 | 4.988 | 4.793 | 4.610 | 4.439 |
| 13 | 6.750 | 6.424 | 6.122 | 5.842 | 5.583 | 5.342 | 5.118 | 4.910 | 4.715 | 4.533 |
| 14 | 6.982 | 6.628 | 6.303 | 6.002 | 5.724 | 5.468 | 5.229 | 5.008 | 4.802 | 4.611 |
| 15 | 7.191 | 6.811 | 6.463 | 6.142 | 5.847 | 5.576 | 5.324 | 5.092 | 4.876 | 4.676 |
| 16 | 7.379 | 6.974 | 6.604 | 6.265 | 5.954 | 5.668 | 5.405 | 5.162 | 4.938 | 4.730 |
| 17 | 7.549 | 7.120 | 6.729 | 6.373 | 6.047 | 5.749 | 5.475 | 5.222 | 4.990 | 4.775 |
| 18 | 7.702 | 7.250 | 6.840 | 6.468 | 6.128 | 5.818 | 5.534 | 5.273 | 5.033 | 4.812 |
| 19 | 7.839 | 7.366 | 6.938 | 6.550 | 6.198 | 5.877 | 5.584 | 5.316 | 5.070 | 4.844 |
| 20 | 7.963 | 7.469 | 7.025 | 6.623 | 6.259 | 5.929 | 5.628 | 5.353 | 5.101 | 4.870 |
| 21 | 8.075 | 7.562 | 7.102 | 6.687 | 6.312 | 5.973 | 5.665 | 5.384 | 5.127 | 4.892 |
| 22 | 8.176 | 7.645 | 7.170 | 6.743 | 6.358 | 6.011 | 5.696 | 5.410 | 5.149 | 4.910 |
| 23 | 8.266 | 7.718 | 7.230 | 6.792 | 6.399 | 6.044 | 5.723 | 5.432 | 5.167 | 4.925 |
| 24 | 8.348 | 7.784 | 7.283 | 7.835 | 6.434 | 6.073 | 5.746 | 5.451 | 5.182 | 4.937 |
| 25 | 8.422 | 7.843 | 7.330 | 6.873 | 6.464 | 6.097 | 5.766 | 5.467 | 5.195 | 4.948 |
| 26 | 8.488 | 7.896 | 7.372 | 6.906 | 6.490 | 6.118 | 5.783 | 5.480 | 5.206 | 4.956 |
| 27 | 8.548 | 7.942 | 7.409 | 6.935 | 6.513 | 6.136 | 5.797 | 5.492 | 5.215 | 4.964 |
| 28 | 8.601 | 7.984 | 7.441 | 6.961 | 6.533 | 6.152 | 5.810 | 5.502 | 5.223 | 4.970 |
| 29 | 8.650 | 8.022 | 7.470 | 6.983 | 6.551 | 6.166 | 5.820 | 5.510 | 5.229 | 4.975 |
| 30 | 8.694 | 8.055 | 7.496 | 7.003 | 6.566 | 6.177 | 5.829 | 5.517 | 5.235 | 4.979 |
| 31 | 8.733 | 8.085 | 7.518 | 7.020 | 6.579 | 6.187 | 5.837 | 5.523 | 5.239 | 4.983 |
| 32 | 8.768 | 8.112 | 7.538 | 7.035 | 6.590 | 6.196 | 5.844 | 5.528 | 5.243 | 4.986 |
| 33 | 8.800 | 8.135 | 7.556 | 7.048 | 6.600 | 6.203 | 5.849 | 5.532 | 5.246 | 4.988 |
| 34 | 8.829 | 8.157 | 7.572 | 7.060 | 6.609 | 6.210 | 5.854 | 5.535 | 5.249 | 4.990 |
| 35 | 8.855 | 8.176 | 7.586 | 7.070 | 6.616 | 6.215 | 5.858 | 5.538 | 5.251 | 4.992 |
| 36 | 8.878 | 8.192 | 7.598 | 7.079 | 6.623 | 6.220 | 5.862 | 5.541 | 5.253 | 4.993 |
| 37 | 8.900 | 8.208 | 7.609 | 7.087 | 6.629 | 6.224 | 5.864 | 5.543 | 5.255 | 4.994 |
| 38 | 8.918 | 8.221 | 7.619 | 7.094 | 6.634 | 6.228 | 5.867 | 5.545 | 5.256 | 4.995 |
| 39 | 8.936 | 8.233 | 7.627 | 7.100 | 6.638 | 6.231 | 5.869 | 5.547 | 5.257 | 4.996 |
| 40 | 8.951 | 8.244 | 7.635 | 7.105 | 6.642 | 6.234 | 5.871 | 5.548 | 5.258 | 4.997 |

## DETAILED PARTIAL BUDGET WORKSHEET

Disadvantages: Quadrant #1 - Added Annual Costs Expected

VARIABLE COSTS — Your Farm

1. Fuel Costs
   _____ litres/bu x _____ bu x _____ litre _____
2. Tractor Fuel
   .....bu / .....bu/hr = _____ hours x _____ hour _____
3. Lubrication _____
4. Electric Power Costs _____
5. Repairs _____
6. Labor _____

Total Variable Costs _____

Variable Cost per Bushel

_____ ÷ _____ = _____ per bu

FIXED COSTS

Annualization of capital investment assuming equal annual fixed costs at opportunity cost rate.

Formula:
(Original Investment - Present Value of Salvage) divided by cumulative present value factor for use of machine for _____ years at _____%.

_____ – _____ = _____

_____ ÷ _____ = _____

Amortized annual costs _____

Insurance _____

Housing _____

Increased in fixed monthly power bill _____

TOTAL FIXED COSTS _____

Total added annual costs expected _____

## DETAILED PARTIAL BUDGET WORKSHEET

| Disadvantages: Quadrant #2 - Reduced Annual Receipts Expected |
| --- |
| |
| Total Reduced Annual Receipts Expected _____ |

## DETAILED PARTIAL BUDGET WORKSHEET
## ESTIMATED ADDED RETURNS

**Advantages: Quadrant #3 - Added Annual Receipts Expected**

| | Your Farm |
|---|---|
| 1. Grade Loss Avoided (¼ of total harvest 1 grade better)<br>_____ acres x _____ bu/ac x _____ bu differential | = _____ |
| 2. "Tough" Discount Avoided<br>_____ acres x _____ bu/ac x _____ bu | = _____ |
| 3. Bushel Weight Saved<br>_____ lb/bu ÷ _____ lb/bu x _____ ac (continued)<br>x _____ bu/ac x _____ /bu | = _____ |
| 4. Reduced Mechanical Losses<br>_____ bu/ac x _____ ac = _____ bu x _____ bu | = _____ |
| 5. Reduced Natural Losses<br>_____ bu/ac x _____ ac x _____ bu | = _____ |
| 6. In-Field Overdrying Avoided | _____ |
| 7. Improved Germination (seed or malt barley grade) | _____ |
| 8. Easier Marketing | _____ |
| 9. In Bin Spoilage Losses Reduced or Eliminated | _____ |
| 10. Non-Completion Losses Avoided | _____ |
| 11. More Time For Fall Work | _____ |
| 12. Custom Drying | _____ |
| **TOTAL ADDED ANNUAL RECEIPTS EXPECTED** | _____ |

## DETAILED PARTIAL BUDGET WORKSHEET

| Advantages: Quadrant #4 - Reduced Annual Costs Expected | Your Farm |
|---|---|
| 1. Labor | _____ |
| 2. Reduced Swathing Costs | _____ |
| 3. Reduced Combining Costs | _____ |
| 4. Less Equipment Investment | _____ |
| 5. Save Custom Drying Costs | _____ |
| 6. Other | _____ |
| Total Reduced Annual Costs Expected | _____ |

## PARTIAL BUDGET

Estimated change in annual farm profits from the proposed change of _____

_____

_____

_____

| Disadvantages (Debits) | Advantages (Credits) |
|---|---|
| 1. Added Annual Costs Expected | 3. Added Annual Receipts Expected |
| 2. Reduced Annual Receipts Expected | 4. Reduced Annual Costs Expected |
| Total Disadvantages A. | Total Advantages B. |
| Estimated Change in Annual Farm Profits (B minus A) | |

## OTHER CONSIDERATIONS OF PROPOSED CHANGE

| | |
|---|---|
| Extra Capital Needed _____ | Degree of risk _____ |
| Extra labor to hire _____ | Time lag until income starts _____ |
| Other Disadvantages of Proposed Change | Other Advantages of Proposed Change |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

## YEARLY CASH FLOW FOR PROPOSED CHANGE

| YEAR | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DISADVANTAGES<br><br>1. Added annual costs<br>Variable<br>Fixed (cash)<br>Loan payments<br><br>2. Reduced receipts | | | | | | | | | | |
| TOTAL DISADVANTAGES | | | | | | | | | | |
| ADVANTAGES<br><br>3. Added annual receipts<br><br>4. Reduced annual costs | | | | | | | | | | |
| TOTAL ADVANTAGES | | | | | | | | | | |
| CASH SURPLUS OR DEFICIT | | | | | | | | | | |